

FIG 1

CONVERGENT X-RAY OPTICS

APERTURE

MOVABLE MASK

SINGLE STRAND OR MULTI-STRAND CABLE OR WIRE ROPE

ADJUSTABLE PIVOT

ADJUSTABLE PIVOT AND CLAMPING DEVICE

ADJUSTABLE CLAMP

IN/OUT MOVEMENT

RIGHT ARM ADJUSTMENT

LEFT ARM ADJUSTMENT

UP/DOWN PIVOT MOVEMENT

PROTECTIVE SHIELD

16

20

22

24

26

28

30

32

34

36

38

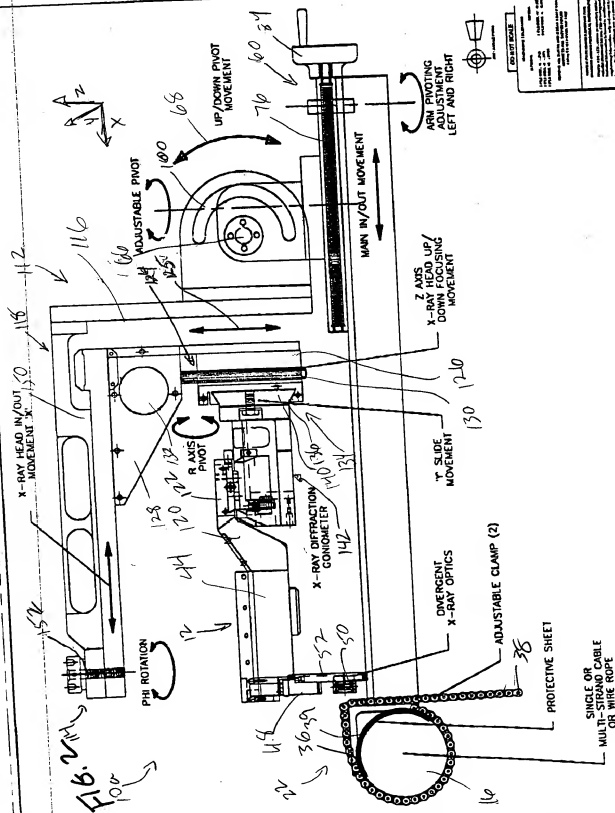
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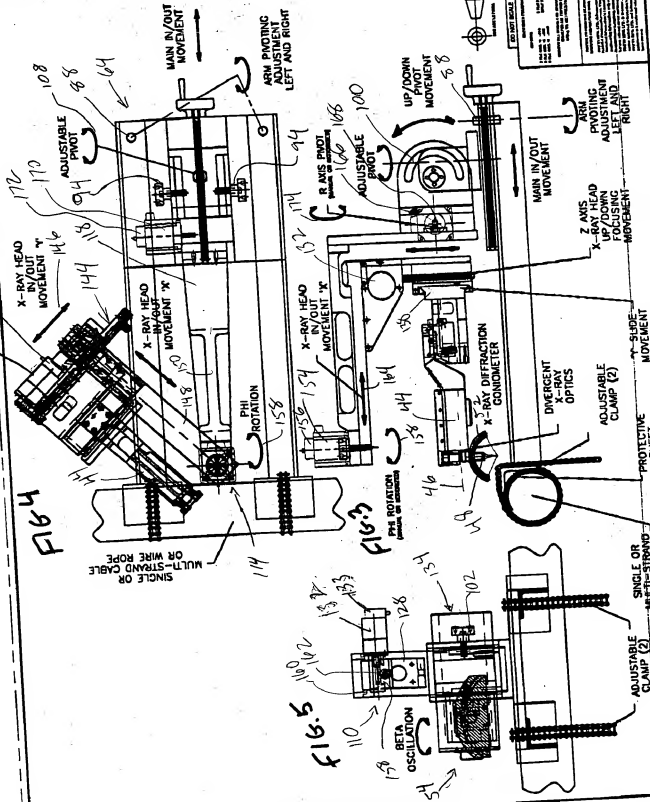
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**CABLE STRESS
ANALYSIS XRD SYSTEM**

RD-103

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00000-00000000

NOTE



CABLE STRESS ANALYSIS XRD SYSTEM

RD-103

PROTOTYPE

DATE: 03/30/2000

BY: [Signature]

FOR: [Signature]

REVISIONS

REV	DATE	DESCRIPTION
1	03/30/2000	PROTOTYPE

FIG. 10

C/10

"AUTOFOCUS" flowchart in Proto XRDWin software

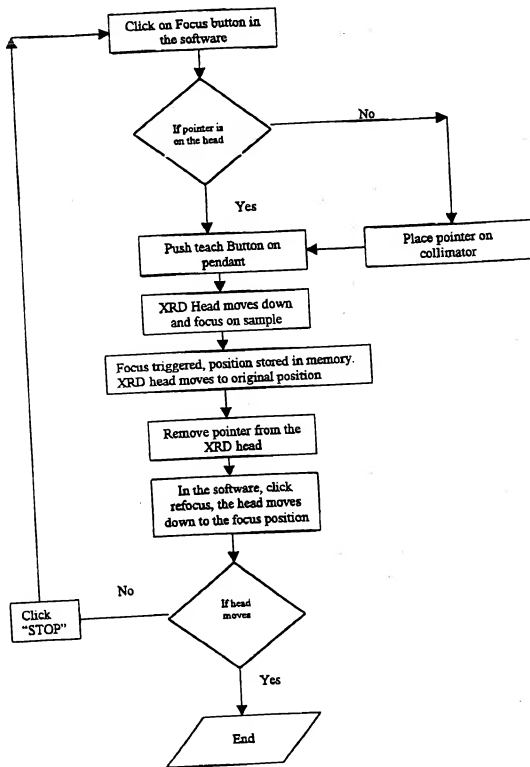


FIG. 11A

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"TEACH- MAP" Flow -Chart

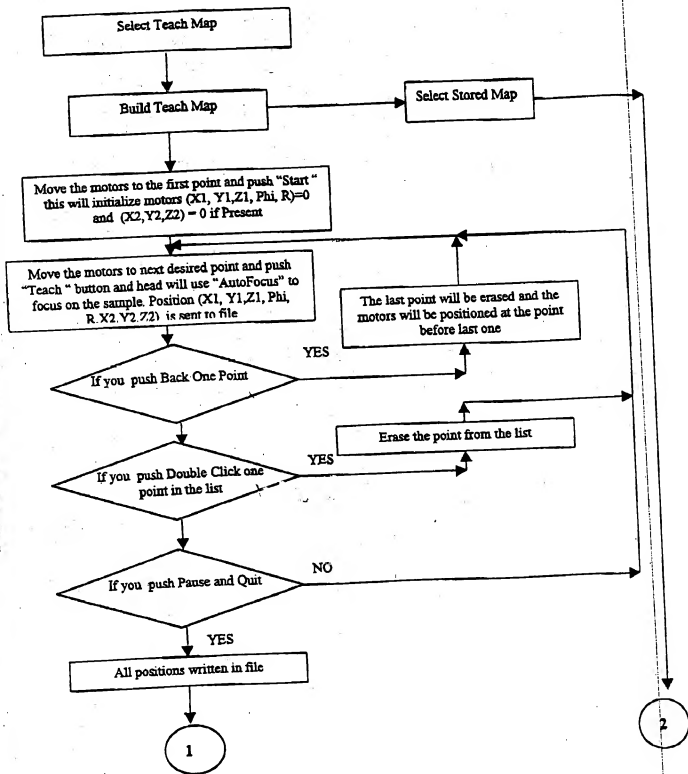
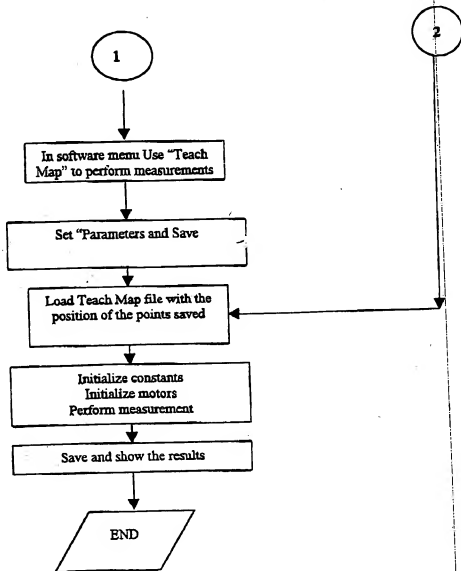
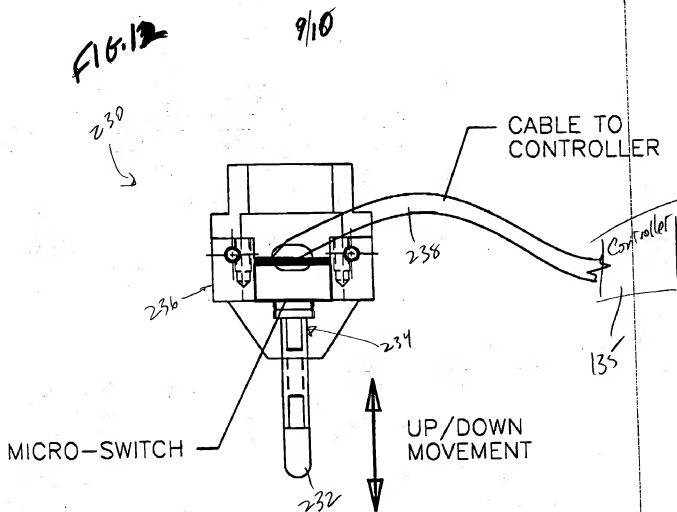


FIG. 11B

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00530346 033100



DO NOT SCALE

DIMENSIONS TOLERANCE

IMPERIAL		METRIC	
6 PLD HOLE	± .010	1 PLD HOLE	± .038
8 PLD HOLE	± .008	2 PLD HOLE	± .030
4 PLD HOLE	± .006		

REMOVE ALL SURFACES AND BREAK SHARP EDGES
CHAMFER ALL TAPPED HOLES
ADDS TO USE OVER TAP SIZE

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DET.	SHY.	AWT.	DESCRIPTION
			2175 Solar Crescent Glendale, ON M9R 1L0 Can: (519) 757-6330 USA: (315) 956-2900
FOCUS POINTER			
FILE	20000327	SCALE	1/2" = 1"
DESIGN	JBC	DATE	RD-103
SHEET NO. 05			A

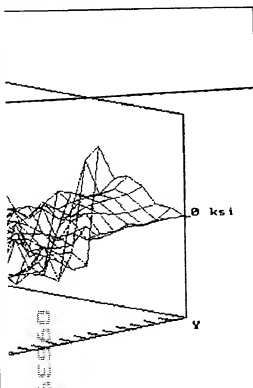
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UNLEASH the Power of Automated Stress Mapping®

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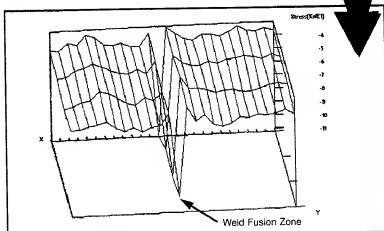
RESIDUAL STRESS TRACKING® (RST®)

Characterizing Residual Stress on the same component after different processes to solve premature fatigue failure.



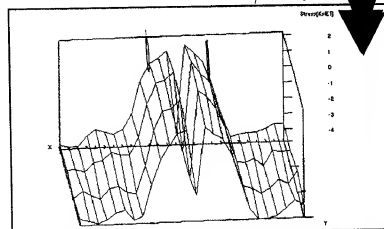
NOTE: Localized area of high tensile stresses in heat affected zone presents greater potential risk of crack initiation. This area may not have been detected without the application of automated stress mapping.

FIG 13A



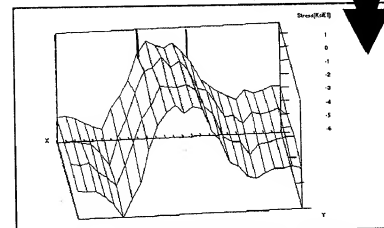
The residual stress map after resistance welding.

FIG 13B



The same weld after "heat treatment". NOTE: Introduction of tensile residual stresses sufficient to reduce fatigue life.

FIG 13C



The same weld after hand grinding further introducing counter productive tensile stresses.

Laser Welded Stainless Steel Pipe

The residual stress in a 316 stainless steel pipe that was laser welded was mapped through the weld and parent material. The concern was that the laser weld has created tensile residual stress levels near yield which could decrease the burst strength of the pipe while in service.

The residual stress map above reveals localized tensile residual stress areas in the center of the laser weld. If this section of pipe were placed in service, the tensile residual stress maxima already existing in the center of the weld would be increased even more due to the applied stress of the working pressure on the pipe, thus making this area highly susceptible to SCC. Some post weld residual stress management process would be recommended to introduce compressive surface stresses in the weld and HAZ.